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09/749,388	12/28/2000	Yuki Hidaka	1422-0454P	5562

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EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 05/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/749,388

Applicant(s)

HIDAKA ET AL.

Examiner

Callie E. Shosho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

**Claim Rejections - 35 USC § 112**

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 4-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claim 4 recites that the graft copolymer has nonionic polymer side chain and then recites specific types of side chains.

Due to the double inclusion of “or” in lines 13 and 15 of the claim, the scope of the claim is confusing because it is not clear what comprises the side chain. Is the side chain (i) polymer made from monomer of formula (2), (ii) polymer made from monomer of formula (3), (iii) polymer made from monomer of formula (2) and monomer of formula (3), or (iv) group represented by formula (4)? If so, it is suggested that “or” is deleted from line 13.

(b) Claim 6, which depends on claim 5, recites that the “initiator precursor structure which is convertible to an initiator structure by the reaction...”. The scope of the claim is confusing because it is not clear what is meant by “the reaction” What reaction is this referring to? The addition reaction recited in claim 5 or some other reaction? Clarification is requested.

**Claim Rejections - 35 USC § 102**

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in–

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

4. Claims 1-4 are rejected under 35 U.S.C. 102(e) as being anticipated by Ma et al. (U.S. 6,117,921).

Ma et al. disclose water-based ink jet ink comprising colorant and graft copolymer having backbone portion and side chain portion wherein either the backbone portion or the side chain portion is hydrophilic and the other portion is hydrophobic. The hydrophobic portion is obtained from at least 50% monomer including (meth)acrylate as well as up to 20% hydrophilic monomer such as (meth)acrylic acid, and up to 30% monomer such as N,N-dimethylaminoethyl acrylate, i.e. salt-forming monomers. The hydrophilic portion is obtained from 2-100% ionizable monomer such as (meth)acrylic acid and N,N-dimethylaminoethyl acrylate, i.e. salt-forming monomers, as well as comonomers including C<sub>1</sub>-C<sub>12</sub> (meth)acrylates and nonionic hydrophilic monomer of the formula CH<sub>2</sub>=(C(R<sub>3</sub>)C(O)O(CH<sub>2</sub>CH<sub>2</sub>O)<sub>m</sub>)-R<sub>4</sub> where R<sub>3</sub> is H or CH<sub>3</sub>, R<sub>4</sub> is H or C<sub>1</sub>-C<sub>4</sub> alkyl, and m is 1-100. The graft copolymers are made by copolymerizing (meth)acrylic macromonomers with the other monomers described above (col.2, lines 25-39, col.3, lines 18-20,

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col.4, lines 31-33 and 39-45, col.5, lines 10-61, col.6, lines 10-16, 20-30, 38-53, and example 11).

In light of the above, it is clear that Ma et al. anticipate the present claims.

5. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Anton et al. (U.S. 6,005,023).

Anton et al. disclose water-based ink jet ink comprising colorant and graft copolymer having polymeric backbone and macromonomer side chain. The polymeric backbone is obtained from C<sub>1</sub>-C<sub>8</sub> (meth)acrylate as well as up to 30% ethylenically unsaturated acid such as acrylic acid, i.e. salt-forming monomer. The macromonomer side chain is obtained from ethylenically unsaturated monomer such as methacrylic acid and its esters as well as monomer such as ethoxytriethyleneglycol methacrylate. The graft copolymers are made by copolymerizing the macromonomer with the monomers used to obtain the polymeric backbone as described above (col.1, lines 65-67, col.2, lines 30-37, col.3, lines 17-30 and 48-61, col.4, lines 12-16 and 24-25, col.5, lines 8-19, and col.8, lines 45-47).

In light of the above, it is clear that Anton et al. anticipate the present claims.

**Claim Rejections - 35 USC § 103**

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (U.S. 6,117,921) or Anton et al. (U.S. 6,005,023) either of which in view of Tone et al. (U.S. 5,336,725).

The disclosures with respect to Ma et al. and Anton et al. in paragraphs 4 and 5, respectively, are incorporated here by reference.

The difference between either Ma et al. or Anton et al. and the present claimed invention is the requirement in the claims of specific process used to prepare graft copolymer.

Tone et al., which is drawn to method for preparing graft copolymer, disclose making graft copolymer by reacting polymeric compound having one or more acrylic ester units in its molecular chain with metalizing agent followed by silanizing agent in order to produce a polymeric initiator which then initiates the polymerization of monomers such as (meth)acrylic esters to form the side chain of the graft copolymer wherein the polymeric portion of the polymeric initiator becomes the backbone of the graft copolymer (col.2, lines 8-15, 40-45, and 48-56, col.3, lines 32-45, and example 1).

The motivation for using such method is to produce graft copolymer with regulated molecular structure that has excellent transparency, weather resistance, and physical properties (col.1, lines 7-9 and col.10, lines 58-col.11, line 15).

In light of the motivation for using specific graft copolymerization method disclosed by Tone et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such method to produce the graft copolymer in either Ma et al. or Anton et al. in order to produce a graft copolymer with regulated molecular structure that has excellent transparency, weather resistance, and physical properties, and thereby arrive at the claimed invention.

9. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (U.S. 6,117,921) or Anton et al. (U.S. 6,005,023) either of which in view of either Nguyen et al. (U.S. 6,057,384) or Razavi (U.S. 5,629,365).

The disclosures with respect to Ma et al. and Anton et al. in paragraphs 4 and 5, respectively, are incorporated here by reference.

The difference between either Ma et al. or Anton et al. and the present claimed invention is the requirement in the claims that the graft copolymer has a specific functional group.

Nguyen et al., which is drawn to ink jet ink, disclose incorporating monomers which function as UV absorbers into the polymer present in the ink in order to impart lightfastness to the polymer, and thus, the ink (col.8, lines 1-3 and col.14, line 52-col.15, line 44).

Alternatively, Razavi, which is drawn to UV absorbing polymer latex suitable for use in inks, discloses incorporating UV absorbing monomer into the polymer in order to produce colorfast ink. It is noted that Razavi also disclose using the UV absorbing polymer latex in addition to acrylate polymers typically found in inks (col.2, lines 48-55 and col.7, line 59-col.8, line 5).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use graft copolymer which incorporates UV absorbing monomer into its structure in either Ma et al. or Anton et al. in order to produce ink composition which has good lightfastness or colorfastness, and thereby arrive at the claimed invention.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al.(U.S. 6,117,921) or Anton et al. (U.S. 6,005,023) either of which in view of Yui et al. (U.S. 5,977,207).

The disclosures with respect to Ma et al. and Anton et al. in paragraphs 4 and 5, respectively, are incorporated here by reference.



The difference between either Ma et al. or Anton et al. and the present claimed invention is the requirement in the claim of UV absorber and antioxidant.

Yui et al., which is drawn to ink jet ink, disclose the use of additives such as antioxidant and UV absorbing agent in the ink composition (col.6, lines 51-52). It would have been within the skill level of one of ordinary skill in the art to include these additives in order to prevent oxidation of the ink as well as impart lightfastness to the ink.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use antioxidant and UV absorbing agent in the ink of either Ma et al. or Anton et al, and thereby arrive at the claimed invention.

11. Claims 1, 4, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beach et al. (U.S. 5,589,522) in view of Ma et al. (U.S. 6,117,921).

Beach et al. disclose a water-based ink jet ink which comprises colorant and graft copolymer having acrylic polymer side chain and salt-forming group wherein the graft copolymer is made by reacting a reactive group on the polymer which forms the backbone with reactive group on the polymer which forms the side chain (col.2, lines 12-20 and 38-44, col.5, lines 15-16, and example 6).

The difference between Beach et al. and the present claimed invention is the requirement in the claims of specific type of side chain.

Ma et al., which is drawn to ink jet ink comprising graft copolymer, disclose that hydrophilic monomers of the formula  $\text{CH}_2=\text{C}(\text{R}_3)(\text{C}(\text{O})\text{O}(\text{CH}_2\text{CH}_2\text{O})_m)-\text{R}_4$  where  $\text{R}_3$  is H or  $\text{CH}_3$ ,  $\text{R}_4$  is H or  $\text{C}_1\text{-C}_4$  alkyl, and m is 1-100 are incorporated into the graft copolymer, including

the side chain, in order to adjust the hydrophobicity/hydrophilicity balance and solubility properties of the copolymer (col.6, lines 20-37).

In light of the motivation for using specific type of side chain disclosed by Ma et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use graft copolymer with such side chain in the ink of Beach et al. in order to produce graft copolymer with desired hydrophobicity/hydrophilicity balance and solubility, and thereby arrive at the claimed invention.

12. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beach et al. in view of Ma et al. as applied to claims 1, 4, and 7 above, and further in view of either Nguyen et al. (U.S. 6,057,384) or Razavi (U.S. 5,629,365).

The difference between Beach et al. in view of Ma et al. and the present claimed invention is the requirement in the claims that the graft copolymer has a specific functional group.

Nguyen et al., which is drawn to ink jet ink, disclose incorporating monomers which function as UV absorbers into the polymer present in the ink in order to impart lightfastness to the polymer, and thus, the ink (col.8, lines 1-3 and col.14, line 52-col.15, line 44).

Alternatively, Razavi, which is drawn to UV absorbing polymer latex suitable for use in inks, discloses incorporating UV absorbing monomer into the polymer in order to produce colorfast ink. It is noted that Razavi also disclose using the UV absorbing polymer latex in addition to acrylate polymers typically found in inks (col.2, lines 48-55 and col.7, line 59-col.8, line 5).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use graft copolymer which incorporates UV absorbing monomer into its structure in Beach et al. in order to produce ink composition which has good lightfastness or colorfastness, and thereby arrive at the claimed invention.

13. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beach et al. in view of Ma et al. as applied to claims 1, 4, and 7 above, and further in view of Yui et al. (U.S. 5,977,207).

The difference between Beach et al. in view of Ma et al. and the present claimed invention is the requirement in the claim of UV absorber and antioxidant.

Yui et al., which is drawn to ink jet ink, disclose the use of additives such as antioxidant and UV absorbing agent in the ink composition (col.6, lines 51-52). It would have been within the skill level of one of ordinary skill in the art to include these additives in order to prevent oxidation of the ink as well as impart lightfastness to the ink.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use antioxidant and UV absorbing agent in the ink of Beach et al., and thereby arrive at the claimed invention.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chu et al. (U.S. 5,231,131) disclose pigment dispersion containing graft copolymer dispersant and process for making graft copolymer from macromonomer.


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15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Callie E. Shosho  
Examiner  
Art Unit 1714

  
Callie Shosho

5/8/02